

Study #SP-R7 Reservoir Boating Survey

December 11, 2001

1.0 Introduction/Background

Boating is a major recreation activity in the Study Area, and is directly affected by project operations, particularly reservoir pool levels. This study will address Issue Statement R1—adequacy of existing recreation facilities, opportunities, and access to accommodate current use and future demand, and the following specific recreation issues: RE—1, 2, 5-17, 19-39, 55, 56, 60, 64-83, 95, 96, 104 and 105. The most recent relevant study that will be utilized as an information source is the 1996 study conducted by Guthrie et al. (1997). A list of other relevant studies is included in Attachment A.

2.0 Study Objective

The main objective of this study is to describe existing boating use and water surface management on Lake Oroville and other water bodies where boating is permitted within the Study Area. The study will address Issue Statement R1 concerning adequacy of recreation facilities. Study results will be used to determine existing use levels for boating, and to help determine if any water surface management changes are needed.

3.0 Relationship to Relicensing/Need for the Study

This study is needed to meet the Federal Energy Regulatory Commission's (FERC's) direction regarding preparation of comprehensive recreation plans, and more specifically to include information in the license application regarding existing recreation uses at project facilities and waters (Chapter 1, Subpart F, Section 4.51 of 18 CFR).

Additionally, the study is needed to accurately assess the impact of project operations, recreation area management, and fish and wildlife management on reservoir boating. Guthrie et al. only superficially examined reservoir boating. A brief survey was administered to boaters as they entered controlled areas. Rischbieter (2001) reported use in terms of boat launches for 1995 and 2000, however, boater surveys were not part of that study.

4.0 Study Area

The Study Area includes Lake Oroville, the lands and waters within and adjacent to (1/4 mile) the FERC project boundary, and adjacent lands, facilities, and areas with a clear project nexus. The following sites are included:

- Thermalito North Forebay
- Thermalito South Forebay
- Thermalito Afterbay
- Lake Oroville

5.0 General Approach

Task 1—Research Local Boating Issues

This task will research boating issues in the Study Area, including boating accident statistics, boating law enforcement problems, and boating regulations and management. Boating regulations will be summarized by reservoir. Current and historical accident information and boating regulations will be obtained from the Butte County Sheriff's Office, California Department of Parks and Recreation (DPR), and California Department of Boating and Waterways (DBW). Accident history information will, at a minimum, identify yearly total boating accidents, boating deaths, and boating-related property damage. If DBW releases additional boating accident information, such as causes and descriptors of boating accidents, then this information will also be summarized. Water hazards will also be identified at various pool levels. The number of times that a particular launch ramp or boating area experienced bad conditions will also be noted. Other issues of concern to the general public and boating-related business owners will be solicited in questionnaires which will be developed for Study #13—Recreation Surveys (problems with stumps, shallow areas, etc.).

Task 2—Assess Boating Use Levels

Prior to estimating use, each body of water for which data will be collected may be divided into segments. Due to its size, Lake Oroville will be divided into four segments. One segment will include the West Branch and North Fork, and the second will include the junction of the West Branch and North Fork to Foreman Creek. The third segment will encompass the main portion of the reservoir, south of Foreman Creek to the dam, and the fourth segment will include the Middle and South Forks. Depending on field conditions, a similar approach may be applied to other water bodies where data collection will occur.

For each body of water being sampled, two field staff will be involved, one to operate the boat, the other to record use. Boating use levels will be assessed on Lake Oroville, Diversion Pool, Spillway, Thermalito North Forebay, Thermalito South Forebay, and Thermalito Afterbay. Boating types that will be assessed include watercraft numbers, watercraft types (power boats, personal watercraft (PWC), sailboats, non-motorized boats, etc.), and boating-related activities (water skiing, fishing, etc.). Existing use will also be noted for Boat-In Campsites (BICs) at Bloomer Primitive, Vinton Gulch, Goat Ranch, Foreman Creek, and Craig Saddle. Existing use information will, for each reservoir, summarize boats at-one-time on the water surface, and vehicles and boat trailers at-one-time. Parking lot capacities at boat launches during morning, afternoon, and evening periods during weekday, weekend, and holiday periods will also be discussed. Data for these estimates will be used in Study #9—Existing Recreation Use Study. Use estimates will be collected throughout the year. Use estimates will generally coincide with Study #9 use sampling times (Table 1). While on Lake Oroville Reservoir, Forebays, or Afterbay in a boat during survey days, researchers will also survey use at shoreline dispersed sites. Along with use estimates, information on boating conditions will be collected. A rating system (i.e., poor, fair, good, etc.) will be developed to facilitate rapid, objective assessment of boating conditions. A sample data collection form is included in Attachment B.

To validate boating use levels obtained during reservoir counts, aerial photography will be used to count all boats on the reservoir during several randomly selected days.

Table 1
Tentative Sampling Schedule for Monitoring Boating Use

| Season | Boating Areas | |
|------------------------------|-------------------|---------------------------------|
| | Reservoir Day Use | Boat-In Campsites Overnight Use |
| Spring, 2002 | | |
| May | 6 | 4 |
| -Memorial Day Weekend | 3 | 4 |
| BLD Subtotals | 9 | |
| Summer, 2002 | | |
| June | 2 | 2 |
| July | 4 | 2 |
| -Independence Day | 1 | 2 |
| August | 4 | 6 |
| BLD Subtotals | 11 | |
| Fall, 2002 | | |
| September | 2 | 2 |
| -Labor Day Weekend | 3 | 2 |
| October | 2 | 2 |
| November | 2 | 6 |
| BLD Subtotals | 9 | |
| Winter, 2002-2003 | | |
| December | 1 | 1 |
| January | 1 | 1 |
| February | 1 | 1 |
| -Presidents' Day Weekend | 3 | 1 |
| March | 1 | 1 |
| BLD Subtotals | 7 | 4 |
| Spring, 2003 | | |
| April | 4 | 4 |
| -Spring Break/Easter Weekend | 3 | 4 |
| BLD Subtotals | 7 | 8 |
| Totals | 43 days | 24 days |

Task 3—Assess Boating Infrastructure

This task will present data on the overall infrastructure that supports boating (marinas, boat launches, gas supply, docks, pump-outs, etc.). Facility conditions will also be summarized. Data for this assessment will be collected in Study #10—Recreation Facility and Condition Inventory. Infrastructure deficiencies will be noted and summarized. The existing level of boating infrastructure and services will be compared with boating facility standards (States Organization for Boating Access (SOBA) and National Recreation and Park Association (NRPA) etc.) to determine if there are any deficiencies based on standards.

How reservoir pool levels may affect access to recreation facilities and the reservoirs will be assessed as required by FERC. Potential effects to boating infrastructure will also be assessed and documented. For boat launch sites an assessment of the ramp's effectiveness at high and low pool will be conducted. An effective bottom elevation for the toe of each ramp lane will be identified.

A minimum of 3 feet of water at the toe of the ramp is commonly used as a standard to assess effectiveness and accessibility at boat launches. Typical periods of time when this standard is not met will be described for each body of water. Further comparison will be made with visitation trends (peak and holiday use) and the availability of other public ramps to meet seasonal and year-round boater access needs (at least one ramp available year-round per reservoir if feasible). Other potential issues related to floating docks, gangways, fuel docks, piers, marinas, and other facilities will be discussed with DWR and DPR facility operators and concessionaires. Related pool level effects on shoreline facilities will be collected in Study #13—Recreation Surveys.

Task 4—Assess Boaters’ Perceptions

This task will assess boaters’ attitudes and opinions about the project’s reservoirs and other boaters. Boaters’ attitudes and opinions will be summarized regarding potential water surface crowding; user conflicts; reservoir conditions; boating regulations; launching and docking facilities; pool levels; and potential management and facility improvements.

Boater group characteristics will also be summarized, including group size, primary boating activities, and lengths of stays. Data for these summaries will be collected as part of Study #13—Recreation Surveys.

Task 5—Surface Water Boating Capacity

Surface water boating carrying capacity will be estimated for Lake Oroville, Thermalito Forebays, and Afterbay. Capacity will be assessed based on several factors such as water depth, survey results, and boating standards. Since reservoir pool levels can vary dramatically throughout the year, special emphasis will be placed on examining physical capacity as a function of varying pool levels. This capacity analysis will be conducted in conjunction with Study #8—Carrying Capacity Study. This task will focus on surface water area for boating use. In this analysis, four types of capacity types will be considered: ecological, facility, physical/spatial, and social.

For each body of water, conclusions will be made regarding which of the four capacity types is a limiting factor(s). Qualitative and quantitative data will be used to make these conclusions. A limiting factor is defined as an indicator that limits or puts a cap on the level of recreational use (capacity) at a site or area. For example, the number of boat launches available (facility capacity) potentially limits boating if all the ramps are busy. If boating activity has no space to expand or is constrained by shallows, physical capacity is a second indicator to consider. If a boating area is located next to sensitive wildlife or vegetation resources, these resources may be an ecologically limiting factor. Finally, if a body of water or segment is perceived as extremely crowded or there are user conflicts, social capacity may be a limiting factor no matter what the use level may be. SOBA, NRPA, and other standards will be considered in this assessment.

Once identified, limiting factors will become the focus for assessing recreation capacity at a reservoir or reservoir segment, or monitoring boating capacity in the future. While all four capacity types being considered (physical/spatial, facility, ecological, and social) may potentially be a limiting factor(s), typically only one or two factors dominate. Qualitative and quantitative data will be used in this selection process.

Based on this process, an overall assessment of reservoir and reservoir segment boating capacity will be defined. This assessment will characterize boating use levels in relation to capacity levels using four general conditions: below, approaching, at, or exceeding capacity levels.

Two key timeframes will be considered: typical weekend afternoons in Spring and early Summer, and holiday weekend afternoons from Memorial Day to Labor Day weekends.

For reservoir segments, overall capacity will be assessed based on a review of several capacity types. Ecological concerns will be addressed by reviewing the percentage of shoreline vegetation made up of sensitive riparian/wetland vegetation (from Threatened and Endangered Species (TES) GIS mapping) for each segment, as well as other ecological variables.

The physical/spatial capacity of reservoir segments will be assessed using data on the number of boats counted in each segment and dividing this count by the number of surface water acres in each of the segments. This number will then be compared with a theoretical average number of surface water acres needed per boat. Many boating capacity standards for the surface water acreage needed by boaters have been developed and used over the years (SOBA, NRPA, etc.). These capacity standards cover a wide range, from as few as 4 surface water acres needed per boat to 25 acres needed per boat; a few standards are as high as 40 acres needed per boat for space-dependent activities such as water skiing and PWC use in narrow areas. However, it should be noted that these types of standards are highly dependent on several variables. For this Study Area, physical conditions and reservoir activities will be assessed. A theoretical boating capacity standard for surface water acres needed per boat will be developed in a manner that is reasonable and consistent with other standards.

These boating capacity standards are likely to be subject to variation based on reservoir-specific factors such as water depth, shoreline configuration, visitor perceptions, number of accidents involving other boats, boat types and speeds, dominant boating activities, and the types of activities that are popular on the water and along the shoreline.

Boaters' responses to crowding questions in Study #13—Recreation Surveys, as well as user conflict responses will address social capacity by reservoir segment. Facility capacity by reservoir segment will be addressed by reviewing facility utilization levels at boater facilities located in each segment.

Task 6—Draft Final Report Preparation

This task involves the preparation of a report which will present the results of Tasks 1 through 5. The boating results will be shown in tabular or graphical form along with related descriptive text. A GIS figure will be prepared representing general conditions for Lake Oroville, the Forebays, and the Afterbay.

6.0 Results and Products/Deliverables

Results

Results will be used to determine if management changes or facility upgrades are needed to improve boaters' experiences. Results will also be used to identify potential impacts to natural and cultural resources on the shoreline.

Products/Deliverables

The following products will be developed for this study:

- GIS figure showing surface water boating capacity levels for affected bodies of water at varying pool levels
- GIS map depicting locations of boat hazards for affected bodies of water at varying pool levels
- Interim Report
- Draft Final Report

7.0 Coordination and Implementation Strategy

Coordination with Other Resource Areas/Studies

This study will require coordination with Study #2—Recreation Safety Assessment; Study #3—Assess Relationship of Project Operations and Recreation; Study #4—Assess Relationship of Fish/Wildlife Management and Recreation; Study #5—Assess Recreation Areas Management; Study #6—ADA Accessibility Assessment; Study #8—Carrying Capacity; Study #9—Existing Recreation Use; Study #10—Recreation Facility and Condition Inventory; and Study #12—Projected Recreation Use. It will also require coordination with studies being conducted by the Cultural Resources and Environmental Work Groups.

Issues, Concerns, Comments Tracking, and/or Regulatory Compliance Requirements

The results of the study will address Issue Statement R1—adequacy of existing recreation facilities, opportunities, and access to accommodate current use and future demand, and the following specific recreation issues: RE 1, 2, 5-17, 19-39, 55, 56, 60, 64-83, 95, 96, 104 and 105.

8.0 Study Schedule

Data collection: May 2002 through April 2003.

Data analysis and report writing: May through July 2003.

Interim Report due: November 2002.

Draft Final Report due: August 2003.

9.0 References

Guthrie, R., D. A. Penland, and E. Seagle. 1997. Lake Oroville State Recreation Area Recreational Use Study. Unpublished report, Chico State University, Chico, CA.

Rischbieter, D. C. 2001. Lake Oroville State Recreation Area Summary of Attendance Data, January 1995-December 2000. Technical Information Record ND-01-1

Attachment A

Other Relevant Boating Studies

1. Upper North Fork Feather River, Lake Almanor Reservoir Boating Study
2. A Study of Boater Recreation on Lake Berryessa, CA.
3. DWR Recreation Plan for Lake Oroville State Recreation Area
4. Poe Hydroelectric Project Recreation Studies
5. Lake Oroville State Recreation Area (LOSRA) Attendance Data Summaries (1995-2000)
6. Aquatic Center Attendance Logs
7. LOSRA Recreation Plan
8. Butte Sailing Club turnouts
9. Sailing and Boating Safety Instruction Programs

Attachment B

Sample Reservoir Boating Use Data Collection Form

User Count Observations—Boating and Shoreline Use

Lake Oroville Reservoir

Section A

| | | | Watercraft on Water | | | | Anglers | | Vehicles | | Other Activities Observed | | | | | | | | | Camping |
|--------|--------------------------|------|---------------------|------|-----|--------|---------|------|----------|-------------|---------------------------|------|-------|-----------|------|------|---------|----------|----------|---------|
| Date | Weather | Time | Power | Sail | PWC | Paddle | Boat | Bank | Vehicles | w/ trailers | Picnic | Swim | Relax | Bike/Hike | Hunt | Rest | Equest. | Windsurf | Waterski | Tents |
| 4-Jul | Rainy | 830 | 3 | 0 | 2 | 0 | 0 | 4 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12-Jul | Cloudy | 1331 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26-Jul | Sunny, hot | 905 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1-Aug | AM Clouds\Sun after 1530 | 1435 | 0 | 2 | 0 | 0 | 4 | 2 | 0 | 0 | 6 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22-Aug | AM Clouds\Sun afternoon | 925 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |

Section B

| | | | Watercraft on Water | | | | Anglers | | Vehicles | | Other Activities Observed | | | | | | | | | Camping |
|--------|--------------------------|------|---------------------|------|-----|--------|---------|------|----------|-------------|---------------------------|------|-------|-----------|------|------|---------|----------|----------|---------|
| Date | Weather | Time | Power | Sail | PWC | Paddle | Boat | Bank | Vehicles | w/ trailers | Picnic | Swim | Relax | Bike/Hike | Hunt | Rest | Equest. | Windsurf | Waterski | Tents |
| 4-Jul | Rainy | 850 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 12-Jul | Cloudy | 1340 | 9 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 |
| 26-Jul | Sunny, hot | 925 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 1-Aug | AM Clouds\Sun after 1530 | 1450 | 8 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 22-Aug | AM Clouds\Sun afternoon | 1020 | 4 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Section C

| | | | Watercraft on Water | | | | Anglers | | Vehicles | | Other Activities Observed | | | | | | | | Camping | |
|--------|--------------------------|------|---------------------|------|-----|--------|---------|------|----------|-------------|---------------------------|------|-------|-----------|------|------|---------|----------|----------|-------|
| Date | Weather | Time | Power | Sail | PWC | Paddle | Boat | Bank | Vehicles | w/ trailers | Picnic | Swim | Relax | Bike/Hike | Hunt | Rest | Equest. | Windsurf | Waterski | Tents |
| 4-Jul | Rainy | 910 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12-Jul | Cloudy | 1344 | 5 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| 26-Jul | Sunny, hot | 900 | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 1-Aug | AM Clouds\Sun after 1530 | 1425 | 7 | 0 | 1 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 7 |
| 22-Aug | AM Clouds\Sun afternoon | 1030 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

Section D

| | | | Watercraft on Water | | | | Anglers | | Vehicles | | Other Activities Observed | | | | | | | | | Camping |
|--------|--------------------------|------|---------------------|------|-----|--------|---------|------|----------|-------------|---------------------------|------|-------|-----------|------|------|---------|----------|----------|---------|
| Date | Weather | Time | Power | Sail | PWC | Paddle | Boat | Bank | Vehicles | w/ trailers | Picnic | Swim | Relax | Bike/Hike | Hunt | Rest | Equest. | Windsurf | Waterski | Tents |
| 4-Jul | Rainy | 925 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12-Jul | Cloudy | 1346 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 26-Jul | Sunny, hot | 845 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 1-Aug | AM Clouds\Sun after 1530 | 1420 | 16 | 0 | 2 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| 22-Aug | AM Clouds\Sun afternoon | 1033 | 6 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |